

structures, such as muscles, elæoblast, and probably also the genital organs. The distal portion of the left cœlomic sac, which preserves the form of a tube, becomes the pericardium. This grows forwards, soon reaches the anterior portion of the germinal disk, and, becoming expanded like a club at its anterior end, assumes the shape which is already sufficiently well known from Kowalewsky's description. The lower wall of the expansion of the pericardial sac, which adjoins the endoderm, is differentiated tolerably early as a thickened plate, which represents the rudiment of the heart. The heart itself, which is formed by the invagination of this plate, is not completely developed until the period of the formation of the cyathozoid.

With this I conclude these brief notes on the earliest stages in the development of *Pyrosoma*, and may summarize the chief results of my investigations as follows:—

(i.) The embryo of *Pyrosoma* is formed from both fertilized and unfertilized elements, since not only the blastomeres, but also the kalymocytes, take part in the formation of the cyathozoid.

(ii.) In the differentiation of the germinal layers the nuclear mass first divides into two portions—an ectoderm and a meso-endoderm; of these the latter further differentiates into a multilaminar mesoderm and a unilaminar endoderm.

(iii.) The mesoderm first appears in the form of two typical cœlomic sacs.

(iv.) Of the two cœlomic sacs the left alone undergoes further development, and is subsequently differentiated into an axial mesoderm and a pericardial tube; whereas the right sac breaks up into separate cells, which are afterwards dispersed through the body of the cyathozoid.

Odessa, March 1890.

XXIX.—*On supposed new Species of Land-Mollusca from Borneo belonging to the Genera Opisthostoma and Diplomatina.* By Lieut.-Col. H. H. GODWIN-AUSTEN, F.R.S., F.Z.S., &c.

[Plate VII.]

In the paper on Bornean Cyclostomaceæ published in the 'Proceedings of the Zoological Society,' 1889, p. 332, I recorded and described all the species that were then known to me. Since that time I have received another small

collection through Mr. A. Everett, made in the hills of Borneo by Mr. C. Hose, and I have to thank them both for the further assistance they have thus given to me. We are apparently only beginning to know the richness of the land-molluscan fauna of this great island, so that as it becomes explored in all parts what a wealth of new species we may expect it will produce! Two shells I now describe present a remarkable difference from the hitherto known species of *Opisthostoma* from India and the Malay peninsula in being more or less spined, the first and finest example yet discovered being *O. grandespinoza*, in which the spines are developed in a peculiarly beautiful way. The same variation in Borneo extends to the genus *Diplommatina*, as exemplified in *D. spinosa*. Further exploration by naturalists who know how and where to find these minute shells will no doubt bring to light others equally interesting.

The species of *Diplommatina* now described was sent to me to examine with other species by Mr. Aldrich, of Cincinnati, U.S.A., to whom a collection of Bornean shells had been sent, and a list of which he gave in a paper published in the Journ. Cincinnati Soc. Nat. Hist. April 1889, p. 23. This shell he thought might be *D. concinna*, Adams; but it is not that species, and I have much pleasure in naming it after Mr. Aldrich.

I take this opportunity of giving drawings (Pl. VII. figs. 4, 5) of two species described in my paper quoted above, pp. 342, 343, but which were received too late to include in the plates which illustrated it; they are *Rhiostoma Hungerfordi* and *iris*.

*Opisthostoma pulchella*, sp. n. (Pl. VII. fig. 1.)

Shell pyramidal, thin, narrowly perforate; sculpture, wavy costulation on a smooth surface; upon the lower whorls this forms the base of sharp, thin, white cirque-like bands standing at right angles to the whorl; on the penultimate and antepenultimate these in the centre are produced into short spines; they are generally found worn off at an early stage of growth; colour ochraceous with a golden tinge, nearly white on the free portion of the whorl; spire conical; apex papillate; suture much impressed; whorls 7 up to the constricted portion, whence the latter part is free and curved outwards from the axis and upwards; aperture circular; peristome double, very thin, much expanded, particularly the outer margin.

Size: major diam. 2·2; alt. axis 2·3 millim.

Locality. Baram district, Borneo (*C. Hose*).

This very beautiful shell is another spined form, a competitor for the admiration of the conchologist with *Opisthostoma grandespinoso*, lately described by me; in this species the spines are not so large and have more the character of raised rings.

*Opisthostoma Hosei*, sp. n. (Pl. VII. fig. 2.)

Shell pyramidal, very narrowly perforate; sculpture of the upper whorls quite smooth, the free portion of the last being strongly costulate, the ribs near the aperture being in high relief; colour shining ochre; spire conic, flat-sided, apex blunt; suture shallow; whorls 5, flat, the last free, with considerable twist, compressed, producing a keel; aperture circular; peristome widely expanded.

Size: major diam. 1·8; alt. axis 1·6 millim.

*Locality.* Baram district, Borneo (*C. Hose*).

This is another very distinct form from the same part of Borneo. In the very smooth surface of the first five whorls it is unlike any species with which I am acquainted.

*Diplommatina Aldrichi*, sp. n. (Pl. VII. fig. 3.)

Shell elongately turreted, rather solid; sculpture strong distant costulation; colour dull ochre; spire becoming rapidly pointed, apex sharp; suture well impressed; whorls 8, convex, the constriction in centre above the aperture, penultimate the largest and rapidly decreasing in size above; aperture ovate-vertical; peristome double, expanded; columellar margin vertical and angulate below.

Size: maj. diam. 1·75; alt. axis 3·75 millim.

*Locality.* From either the Kusan or Penggiron districts, S.E. Borneo (*William Doherty*).

This shell is identified as *D. concinna*, H. Adams, in "List of Shells from Borneo," published in the 'Journal of the Cincinnati Society of Natural History,' April 1889, p. 25, by Mr. T. H. Aldrich. This gentleman has very kindly sent his specimen to me to examine, and this I find does not agree with Adams's species.

EXPLANATION OF PLATE VII.

*Fig. 1.* *Opisthostoma pulchella*, sp. n., × 12.

*Fig. 2.* *Opisthostoma Hosei*, sp. n., × 12.

*Fig. 3.* *Diplommatina Aldrichi*, sp. n., × 7.

*Fig. 4.* *Rhiostoma iris*, Godw.-Aust., × 2·5.

*Fig. 5.* *Rhiostoma Hungerfordi*, Godw.-Aust., × 2·5.